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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/660,790	09/12/2003	Stefan Fliss	15540-011001 / 1800230; D	5876
26161	7590	05/18/2006	EXAMINER	
FISH & RICHARDSON PC P.O. BOX 1022 MINNEAPOLIS, MN 55440-1022			ROSENBERGER, RICHARD A	
			ART UNIT	PAPER NUMBER
			2877	

DATE MAILED: 05/18/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

10/660,790

Applicant(s)

FLISS, STEFAN

Examiner

Richard A. Rosenberger

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 09 February 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-5, 7-24, 28, 29 and 31-50 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-5, 7-24, 28, 29 and 31-50 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date <u>10/8/03</u> . | 6) <input type="checkbox"/> Other: _____  |

1. Claims 14 and 42 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

In claim 14, there is not claimed connection between the laser resonator and the remainder of the claim. The optical element is not claimed in any relationship with the laser resonator; the claim is incomplete in that it fails to clearly set forth required relationships between the elements of the claim.

In claim 42, "the laser resonator" has no antecedent basis; there is no connection between the claimed structure of parent claim 1 and a laser resonator as mentioned in claim 41. The claimed structure of claim 1 neither implies nor required a laser resonator.

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 35 and 37 is rejected under 35 U.S.C. 102(e) as being anticipated by Taniguchi et al (US 6,496,257).

The preamble of claim 35 refers to “an optical element of a laser resonator”, but there is no claimed relationship between what is claimed and a laser resonator, and the claimed method steps are not directed specifically to a method which finds its sole utility in a laser resonator. Thus the preamble is a non-limiting statement of intended use.

See figure 19 of the reference, which shows shining a light (from 118) onto a surface of an optical element (OB), detecting light intensity of the reflected portion of the light beam (by detector 120), and comparing the detected light intensity with a reference intensity (see column 31, lines 28-34). The reflected light is detected while the light source (118) is shining its light onto the surface of the optical element; if the light source 118 were not shining light onto the element, there would be no reflected light to detect.

As in claim 37, the system uses the reflected light to indicate whether the contamination falls within a predetermined permissible range (column 32, lines 32-35), and states “when the numerical value is judged as ‘out of range’ ...” (column 32, lines 35-36); such a “out of range” signal is an “error signal” as claimed.

5. Claims 36 is rejected under 35 U.S.C. 103(a) as being unpatentable over Taniguchi et al (US 6,496,257).

See above.

As in claim 36, the reference does not appear to specifically teach the particular angle at which the light is directed onto the optical element. Those of ordinary skill could choose an appropriate angle; a low angle would have been particularly obvious because that reduces the vertical dimensions of the arrangement and makes it more convenient in the context of the entire arrangement.

6. Claims 1-5, 7, 14, 21-24, 40-42, and 44-46 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yasuda et al (US 6,549,271).

See figures 1 and 2(A) – 2(C) of the reference, which shows an apparatus for monitoring the functionality of an optical element (mask 10, which, if is too far out of plane, has impaired functionality – see the reference, column 1, lines 46-59).

As in independent claim 1, there is a detector (30) and a light source (24), the light from which is reflected to the detector (30) by a surface of the optical element facing the detector and the light source. The light source (24) and detector (24) are situated so as to measure the optical element (10) as it is held by a holder (20) for the optical element. While the reference does not disclose a particular arrangement for supporting the light source, detector, and associated optics; it is clear that they must be held in some manner; it would have been at least obvious to install them in a manner in which they are “integrated in” the holder, as this would help insure their proper placement and alignment with respect to the optical element and each other for proper functioning.

As in independent claim 14, as set forth above, in relation to claim 1,, the reference shows the claimed optical element, the detector, and a light source which

directs light to an optical element, which light reflects onto the detector for monitoring the functionality of the optical element. As shown in figure 1, an illumination light source (14) is shown; the reference, in column 19, lines 18-23, notes that the illumination light source can be a laser resonator as claimed.

As in claim 2, the reference shows the light beam being directed to the center of the optical element, and as in claims 3 and 22, the light source and detector are shown disposed laterally to the optical element, at, as in claims 4 and 23, the same angle so that directly reflected light is directed to the detector. As for claims 5 and 24, those in the art could choose an appropriate angle at which to direct the light to the optical element; lower, more grazing angles would have been obvious because this would place the light source and detectors closer to the optical element and thus reduce the vertical size of the arrangement, and the geometry of the arrangement dictates that lower angles produce higher sensitivity. As in claim 7, the reference discloses that the light source can be a light emitting diode and the detector a photodiode; see column 13, lines 33-37. As in claims 40 and 44, the light source is positioned so as not to obstruct the pathway to the optical element, and as in claims 21, 41 and 45, it is at least obvious that the light source and detector be placed diametrically opposed relative to the optical element because this would measure the center of the element.

Claim 42, as best it can be understood, merely adds, like claim 14, a laser resonator in some general presence in the system with no specific relationship to the remainder of the claimed subject matter; see the discussion of claim 14 above. As for claims 42 and 46, the reference does not teach a specific wavelength for the light source (24), although it does teach wavelengths in the ultraviolet for the laser (column 19, lines

20-22). It would have been obvious to choose a different wavelength for the light source (10) than of the laser because there is no reason that the two should be the same, because there are many commonly available light emitting diodes that have different wavelengths than the ultraviolet wavelengths taught for the laser, and having the light source (10) with a wavelength to which the resist on the wafer is sensitive could degrade the exposure by introducing spurious exposure radiation onto the wafer being manufactured.

7. Claims 1, 8-14, 19, 20 28, 29, 31-34 and 47-50 are rejected under 35 U.S.C. 103(a) as being unpatentable over Keilbach (US 5,929,981) in view of Taniguchi et al (US 6,496,257).

It is known in the art to test optical element for contamination in use, by placing an optical contamination measuring means to detect the level of the contamination while the optical element is in place. See Keilbach; note detectors 52.

Keilbach does not show the claimed structure of the contamination detecting means claimed. However, it is known to measure the contamination of an optical element in the manner claimed, using a light source and detector to measure reflected light; see figure 19 of Taniguchi et al. It would have been obvious to use the known system of Taniguchi et al to measure contamination of the optical element in place in the manner taught by Keilbach because it is a known manner of performing a known test; and this use would use the test in its known manner of operation for its known purpose, and the use of the use of the separate light source would allow the contamination to be measured not only when the system is being used, but also when

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the system is being prepared to be used without having to turn on the main measuring laser.

As set forth above in the discussion of Taniguchi, that reference teaches, as in claims 1, 13, 14, and 28, a system with a light source and detector for determining contamination based on light reflected from the optical element. The reference teaches comparison with a reference value (column 31, lines 28-32) as in claims 8 and 32, and teaches an "error signal" (column 32, lines 35-36) as in claims 9, 13, 19, and 33. In a system such as shown by Keilbach, it would have been obvious to turn off the laser (402) when the measurement indicates the optical element is too contaminated, as in claims 20 and 34, because the level of contamination would degrade the measurement and thus the results would be inaccurate and should not be made under those conditions.

The test of Taniguchi does not depend upon the material of which the optical element happens to be made; it would have been obvious to use such a system to measure the contamination of an optical element made of any material, such as those materials of claims 10-12, because those in the art would have recognized that it would have been useful to determine the contamination level of such optical elements.

As set forth above, it would have been obvious to direct light onto the optical element at a low angle as in claims 29 and 13, and teaches keeping the main optical path unobstructed as in claim 48. Placing the light source and detector diametrically opposed, as in claim 49, would have been obvious because this would result in measuring the center of the optical element and thus the area most likely to present operational degradation. As in claim 31, those of ordinary skill in the art could choose appropriate light sources and detectors, such as well-known light emitting diodes and



photodiodes, for the light source and detector of the system of Taniguchi because these are well-known, common, and commercially available elements that would have been recognized as suitable for such purposes. Choosing a light source with a wavelength different from that of laser 402, as in claim 50, would have been obvious because having a different wavelength would allow separation of the light being used to measure contamination from the light being used for the main measurement and thus would increase reliability by avoiding the possibility of the accidental detection of laser light and thus being "fooled" into missing contamination due to an incorrectly high reflection reading.

The use of such a system in any environment in which contamination could be a problem, including optical elements in a laser, as in claims 15-18, or in a system with optical elements maintained a vacuum as in claims 39, 43 and 47, would have been obvious because of the possibility of unwanted contamination and the desire to maintain proper operation which could be compromised by the contamination.

8. In the previous office action a reference to Ortiz (US 5,159,402) was cited which shows measuring damage to optical elements in a laser using light from the laser itself scattered by the damaged optical element. The art does not appear to teach that this sort of damage can be detected in a laser with the sort of reflection test herein disclosed, and thus does not appear to teach or suggest the use of such a reflection-based test to detect this sort of damage to a laser mirror in a laser. As set forth above, the claims as now written do not appear adequately define the system in specific enough terms to distinguish over the use of such a reflection-based system to detect contamination as in

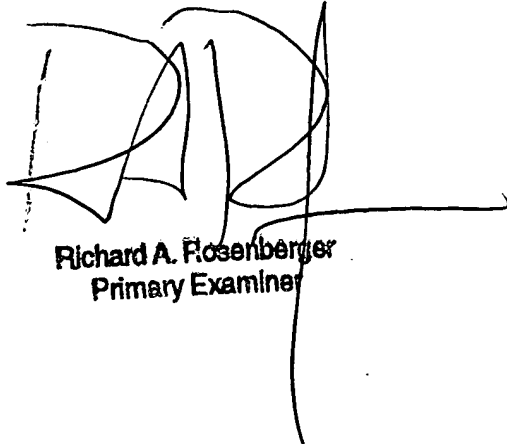
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Taniguchi et al for example. But it appears that claims that sufficiently set forth the system in the actual structure of a laser with means to determine the actual damage to a laser mirror would be allowable.

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Richard A Rosenberger whose telephone number is (571) 272-2428. The examiner can normally be reached on Monday through Friday during the hours of 8:00-4:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Gregory J. Toatley, Jr. can be reached on (571) 272-2800 ext. 77. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

R. A. Rosenberger  
28 April 2006



Richard A. Rosenberger  
Primary Examiner